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ABSTRACT

Although studies of verbal abstracting with the cultural-familial mentally retarded have demonstrated a deficit in the ability, the deficit may not be indicative of a basic cognitive deficit; rather, it may be due to a lack of experience with language of a higher conceptual nature. Several training strategies have been followed to overcome the deficit in verbal abstracting primarily through increasing the child's experience with higher conceptual levels of language. The strategies have been successful in overcoming this deficit on similar tasks, but more information is needed to determine how to enhance generalization of performance to dissimilar tasks. These strategies offer some implications for classroom practice. (Author)

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Studies of verbal abstracting with the mentally retarded[1]

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Abstract

Although studies of verbal abstracting with the cultural-familial mentally retarded have demonstrated a deficit in this ability, this deficit may not be indicative of a basic cognitive deficit; rather, it may be due to a lack of experience with language particularly language of a higher conceptual nature. Several training strategies have been followed to overcome the deficit in verbal abstracting primarily through increasing the child's experience with higher conceptual levels of language. These strategies have been successful in overcoming this deficit on similar tasks, but more information is needed to determine how to enhance generalization of performance to dissimilar tasks. These strategies offer some implications for classroom practice.

Studies of verbal abstracting processes have shown that mentally retarded children generally have difficulty both in the formation of verbal concepts and in the generalization of usage of these concepts (Bount, 1968). Especially with the cultural-familial mentally retarded, this poor abstracting ability may be due in part to their lack of appropriate language (Deutsch, 1965). Since adequate language is considered to be the main means for enabling young children to move from concrete associational forms of learning and thinking to more complex and abstract forms of thought, the cultural-familial retarded child is at a distinct disadvantage (Bruner, 1964). The cultural-familial retarded child's poor verbal abstraction may not be indicative of a basic cognitive incapacity but of an inefficient means of processing incoming stimuli. This inefficient processing may be a result of a lack of exposure to language activities calling for either categorizing verbal stimuli, especially on a higher level of abstraction as seen on standard intelligence or achievement tests, or to activities calling for the use of appropriate verbal labels not usually used in an intellectually restricted environment. It would be expected then that the cultural-familial retarded child may benefit from concept training procedures that attempt to overcome the language as well as the verbal abstracting deficit.

Some of the conditions under which the cultural familial retarded child can learn and generalize verbal abstractions have been observed usually in studies involving the use of associative clustering, sorting or similarities tasks as measures of verbal abstracting ability. In these studies verbal abstraction is most broadly characterized as being the use

of correct verbal categories in the reduction of information.

For teachers of the cultural-familial retarded child, delineation of these conditions are important since they must adopt the most profitable strategies in their training of these children. The present paper is a review of the research in verbal abstraction with the mentally retarded from which are drawn some of the implications for teaching more appropriate verbal abstracting skills to these children. Some of these implications must be incorporated into existing curricula for the cultural-familial mentally retarded because generally as this review will show, these children are capable of higher conceptual functioning if the conditions for learning are organized so as to overcome any language deficit and so as to increase the likelihood that these children can make use of their abilities to the fullest.

Associative Clustering

Associative clustering in recall was first described by Bousfield (1953) who presented a randomized list of associated words, asking subjects to write down all that they could recall. Bousfield found the subjects tended to group words into associated clusters, that is, within categories (e.g. animals-horse, cow, pig, etc.) and not in the manner in which the list was presented. Such organization in recall implied the ability to abstract a general principle as well as assigning each word to its correct category. In the earliest study of associative clustering with the mentally retarded, Weatherwax and Benoit (1957) found no significant differences in clustering performance between mental age (MA) and chronological age (CA) matched organic and non-organic mentally retarded subjects. These authors used twelve pictures from four categories in six presentations. The pictures used were of two major types: functional or taxonomic, with two

categories under each (bathing and smoking as being functional, and animals and food under the taxonomic category) with three items each, e.g., soap, towels and bathtub; cigarettes, smoke and matches; pig, horse and cow; and apple, candy and bread. Recall and clustering improved over trials for both groups.

Osborn (1960) replicated these findings of no significant differences between MA matched groups of organic, cultural-familial and normal subjects. In this study Osborn named each of the objects during each of the presentations.

Rossi (1963) found that the reason why the retarded did as well as their normal MA peers was because the retarded subjects gave more intrusions. When these were corrected for, the normal children did better on clustering, but recalled fewer words than did the retarded subjects.

The results of these early studies suggest that the poor clustering abilities of the mentally as measured by the use of categories in recall (i.e., clustering) may not be due to poor memory or retrieval since these subjects recall as well as equal MA normal subjects, but rather to a lack of information regarding referents of various conceptual categories and to a lack of practice with these categories. Such an interpretation of this deficit in abstracting leads directly into delineating the conditions under which the retarded subject's associative clustering scores may be facilitated. Further, delineation must be made of the conditions necessary for generalization of any improvement of abstraction to both similar and dissimilar conceptual tasks.

Wallace and Underwood (1964) found that whereas normal subjects matched for CA recalled more high similarity words than low similarity words, recall

by the retarded subjects was not facilitated by using high similarity words. This result suggests that the retarded subjects did not take advantage of material lending itself to categorization for more efficient recall. That this appeared to be the case was demonstrated by Spitz (1960) who had the mildly and moderately mentally retarded adolescents sort pictures according to four categories. Although most of the mildly retarded group (70 percent) could sort using all four categories only a few of the second group (10 percent) could and recall was just above chance for both groups indicating that those mildly retarded subjects who had the concepts in their repertoires did not use them in aiding recall.

These results suggest that providing the retarded subjects with words already in categories or by priming (i.e., asking for all of the animals, etc.) would facilitate recall. Gerjuoy and Spitz, (1966) presented a list of 20 words of four categories either in categories or in random, but with a request for recall of each of the concepts. These authors found that facilitation of recall was significant with both of these methods compared to recall under the standard method, but there were no differences between the first two. In a third study these authors extended their findings and found that both of the presented and requested methods in combination facilitated performance significantly more than either procedure alone so that the retarded subjects did not differ from college students.

In a further study Gerjuoy (1967) attempted to see if having half of a list of words presented clustered would have a transfer effect to the other half of a list presented randomly. In this study experience with a clustered list did not facilitate performance on another random

list containing different concepts. Gerjuoy (1967) also found that by having his subjects categorize during presentation facilitated performance significantly more than when words were presented clustered.

The results of this series of studies suggest that priming the retarded subject either through asking for certain categories or by presenting words in categories or by giving the subjects the categories before word presentation facilitates performance on a clustering task involving the same concepts, but not on a task involving different concepts. More involved concept training would be necessary for cross-concept generalization; in addition the last result suggests that the retarded must have had some experience with the concepts before priming would facilitate performance.

Madsen and Connor (1968) ensured that their subjects were familiar with each of their concepts as well as the referents by pre-training and found that such training did improve performance even when words were presented from alternative categories so that these subjects had to actively make use of their pre-training. Cobb and Barnard (1969) extended these results by pre-training their subjects on words from two categories and testing them on five lists diminishing in association value from the pre-trained words. These authors found that whereas normal subjects recalled almost as well across all lists thus making use of even slight verbal mediational cues, the retarded subjects performed the same as the normals only on the high association words and then their performance rapidly deteriorated. The authors concluded that whereas normal subjects were able to take advantage of even the slightest verbal mediational cues,

the retarded subjects performed well only when such cues were strong and made evident by practice. Reiss (1968) compared lists of rhyming words versus words in conceptual categories versus half clustered and half-rhyming lists and found that rhyming did not facilitate recall nearly as well as did the use of conceptual groupings.

The retarded person's experience with concepts does seem to have a significant bearing upon whether they can use them or not to facilitate memory since training on these concepts improves recall. Presenting words in categories may (Bilsky & Evans, 1970) or may not (Cobb and Barnard, 1969; Gerjuoy and Alvarez, 1969) generalize to improve performance with randomly presented words, indicating that the retarded subject needs experience in the application of concepts if generalization is to be expected. The presented clustered method may only work if the concepts are already available to the child. This method also works with materials other than verbal materials (Gerjuoy, Winters, Pullen and Spitz, 1969). Gerjuoy et al. (1969) also found that by giving subjects lists of pairs of clustered words, this improved their recall by 50 per cent over that found with lists of single clustered words which again suggests that experience with the concepts is critical.

Sorting

Many of the above results have also been found in studies involving sorting as a different measure of the ability to abstract which emphasizes the common nature of abstracting skills and suggests another way to develop these skills in the retarded for generalization across circumstances and as a means of maintaining interest in these children.

In the first study involving the mentally retarded, Stacey and Portnoy (1951) compared mildly and moderately retarded institutionalized adolescents on the Object Sorting Test (OST) from the Goldstein-Scheerer tests of abstractness and concreteness which involves sorting according to material, color and form. In the first task the items were spread out and the subjects asked to group those items that belonged together and then asked why they were grouped in those categories. In the second task the items were pre-grouped and the subjects asked why they were grouped thus. The authors found that where there were no significant differences in either task, the mildly retarded group was superior on verbal naming. The results have been replicated by Clark and Thompson (1963) using easy and difficult concepts and using pictures rather than objects. In a similar study Iscoe and Giller (1959) found that their subjects over age thirty-five had difficulty sorting according to accepted criteria and became more idiosyncratic which suggested to the authors that length of institutionalization may effect familiarity with concepts and their referents.

Furth and Milgram (1965) examined the extent to which language effected the sorting performance of normal and retarded children. The subjects were presented with both sets of pictures and words separately and in counter-balanced order and asked to group them according to a common category and then to explain why they did so. The results showed that whereas the retarded children performed as well as they equal MA normal children well than the latter group on the verbal task indicating that experience with language was important.

These authors added two younger groups and found the same results while Milgram (1966) later found that whereas trainable mentally retarded (TMR) children sorted equally well as the educable mentally retarded (EMR) children on the picture task only, they were significantly poorer on verbalizing the concepts.

In a series of three studies Stephens (1964, 1966a, 1966b) found that having the experimenter name the categories to be used as well as the referents involved significantly facilitated the sorting performance of both normal and EMR children, but that performance of the normal children (higher CA) was higher. From this and the second study, Stephens concluded that EMR children do have some concepts available to them, but that they were poorly delineated; that is, they did not know all of the referents again possibly as a result of a lack of language experience. In the final study Stephens found that EMR children do perform as well as equal MA normal children when experience for language is taken into consideration by supplying the categories needed. He further found that these results held true only for some categories that were with their experience and/or training.

In an interesting combination of tactics Hermelin and O'Connor (1958) found that rate of acquisition in paired-associate learning was significantly facilitated when the words belonged to categories rather than being unrelated for functioning institutionalized retarded adolescents. Only two subjects could identify the categories involved; the authors did not check to see if their giving the categories would have facilitated performance on the related words, but the tactic is important because it demonstrates how readily new conceptual information

can be acquired when related conceptually; however, this study does not demonstrate how long retention would be.

Gallagher (1969a, 1969b) demonstrated another strategy for the acquisition of new conceptual information when he found that EMR's learned pairs of words much better when they had some relationship to each other (e.g. deep-hole or run-fast) than when they were opposites.

Since sorting according to categories is facilitated by experience with those categories, Prehm (1966) pre-trained retarded subjects on the use of the appropriate verbal labels and on the use of a similar concept and found that this significantly facilitated performance on another sorting task. Hamilton (1966) corroborated these results in finding that training retarded subjects to errorless criterion on one task significantly improved performance on another sorting task.

The results from those studies in which a sorting task was used show that retarded subjects do have access to some concepts and can make use of them if given practice. These studies also indicate that retarded subjects have difficulty utilizing these concepts when they involve language, but that they can be trained to use them through familiarization and this training can generalize if conditions are suitable.

The literature on both associative clustering and on sorting with the mentally retarded points to a language deficit as the critical factor in their inability to abstract. This language deficit appears to be a result of a lack of experience with appropriate language in their environments. Studies of verbal abstracting using similarities tasks also point towards this language deficit as well as further means

to alleviate both this and the verbal abstracting deficit.

Studies of verbal abstracting using similarities tasks

If the poor verbal abstracting performance seen in the cultural-familial mentally retarded is due to a lack of experience, then an increase in the amount of information should improve this performance at least in part. Increasing the amount of information as a remediation technique was seen previously to facilitate performance on a sorting task (Gerjuoy, Winters, Pullen and Spitz, 1969). In another study, Griffith and Spitz (1958) found that in order to be able to define triads of words with a common definition, mildly retarded young adults had to be able to define at least two words in each triad when presented individually. This finding was replicated by Griffith, Spitz and Lipman (1959) and later by Griffith (1960) who found that the critical ratio for moderately retarded adolescents at least was two/thirds of either three-word or six-word items cirrectly defined individually before they were able to see the commonality between groupings. Miller and Griffith (1961) using retarded subjects, compared concept training given in three sessions versus no training on the ability to identify similarities in triads of words either similar or dissimilar to the trained concepts and found that after a delay of one week, training significantly improved the ability to identify abstractions only for the similar words.

Although in the above studies the authors did not compare the ability to abstract in diads versus the ability to abstract in triads, just giving another example may improve performance significantly. Gordon and Haywood (1969) borrowed a strategy adopted by Blaufarb (1962) and Hamlin, Haywood and Folsom (1965) who found that schizophrenic patients

could identify a proverb when presented with three examples of the proverb even though they could not when only two examples were presented. These authors felt that milder cases of schizophrenia had an intact capacity for performing abstract functions, but that this capacity was disrupted by an input deficit. In more severe cases of schizophrenia (i.e. those with organic symptoms) this capacity was too severely disrupted and could not be overcome by added information (i.e., an enrichment procedure). Gordon and Haywood (1969) felt that this interpretation could also be applied to the cultural-familial and organic mentally retarded and gave both groups a similarities test with two and five examples of each abstraction in a counterbalanced order. These authors found that whereas the cultural-familial adolescents improved their performance significantly under the five-word (enriched) condition over their performance on the two-word condition, the organic adolescents did not show any improvement. Foster (1970) compared the performance of EMR and normal children matched for MA and CA under two, three, four and five-word similarities tests and found that the maximum increase in performance came under the three-word condition. Both normal and EMR children improved their scores under the enriched conditions, but this improvement was significantly greater for the EMR children. These results suggest that giving added information does prime the cultural-familial mentally retarded to make use of the concepts in their repertoires, but perusal of Foster's (1970) raw data indicates that giving extra information does not help the child find the superordinate abstraction if he does not already have it. For example, in the item "how are apples and oranges the same", "you eat them" is a subordinate and is scored one; "fruit" is the superordinate and is scored two in the standard Wechsler procedure. Having an extra example does

not help these children get the concept fruit if they did not get it on the two-word condition. In addition the actual gains in scores are not great; for example, in Foster's (1970) study the cultural-familial group improved from a mean score of 13.25 in the two-word condition to 19.00 on the three-word condition which is still well below the maximum of 40 points or even the 27.14 found for normal 11-year olds. These pieces of evidence suggest that the cultural-familial retarded individual's poor verbal abstracting ability is due to an input deficit, but that it is not only due to a limited number of concept referents which can be overcome by increasing the number of referents; it is also due to a limited number of concepts, and especially higher order concepts, that are available to them. This latter deficit can be overcome by practice with new and nigher order concepts. Tymchuk (1971), for example, had his retarded adolescent boys place each pair of words in a sentence along with the higher order concept and found that this concept familiarization significantly raised their scores on a test involving different examples of the same concepts, but did not on a test involving different concepts. The effect of training was much greater than enrichment. These results indicate that added information does prime for recall, but that this is not enough; concept familiarization and practice with these concepts must be given.

Discussion and Conclusions

The literature involving three different tactics of research on verbal abstracting with the cultural-familial mentally retarded indicates that the poor verbal abstracting abilities often associated with these individuals

may not be indicative of an underlying deficiency in cognition, but rather may be due to inexperience with language involving higher order levels of conceptualization. This interpretation is supported by the results of efforts designed to overcome the abstracting deficit through either increasing the amount of information as a priming effort or by making the concepts part of subjects' experience through practice with the concepts.

Implications for remediating this verbal abstracting deficit are clear and efforts must be taken to systematize them as part of the educational curricula. Some implications are:

1. New verbal information particularly vocabulary should be presented in categories with the category name made explicit.
2. New verbal information should be presented auditorially and visually with a concrete referent where possible.
3. Similarities between stimuli should be made explicit as a matter of course in all teaching. (e.g. the ball is red, but it also round) so that the child learns the strategy for looking for similarities.
4. New conceptual categories should be made directly relevant to the child's home environment.
5. Concepts should be arranged hierarchically and developmentally, i.e., subordinates and superordinates must be taught for each age level.
6. The children should verbalize referents and categories whenever possible and use sentences as a meadiational device.

7. Where possible verbal material should be presented by a combination of methods, for example, in categories with the category name made explicit and with concrete referents.

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